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ABSTRACT

The Research and Development Utilization Program (RDU) was intended to apply research and development products to local school problems; to develop a problem-solving and product selection process usable by local schools; and to organize a linkage system making national, state, and other external resources available to local school personnel. The service delivery system of the RDU program operated through seven projects in 20 states and served over 300 schools or school districts over the period 1976-79. Qualitative research methods, that is, case study reports, site visit material, and coded written reports, are the data sources for this report. The discussion of the preliminary findings places equal emphasis on products and problem-solving processes. Product characteristics positively related to successful programs are validated effectiveness, complexity, and direct impact on pupils. Problem-solving process characteristics positively related to successful programs are linking agent behavior as measured by the amount of time spent by the agent, amount of influence of the agent, and the agent's adoption of a facilitator or process role. (Author/MLF)

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Linking R&D With Schools

Products and Process:
Some Preliminary Findings from the R & D Utilization Program and Their Implications for Federal Dissemination Policies

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PRODUCTS AND PROCESS: SOME PRELIMINARY FINDINGS FROM THE R&D UTILIZATION PROGRAM AND THEIR IMPLICATIONS FOR FEDERAL DISSEMINATION POLICIES

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INTRODUCTION

In June of 1976, the National Institute of Education (NIE) established the Research and Development Utilization (RDU) program as a new action-research effort in dissemination. This program was designed to:

- apply R&D products, or ideas, to school problems;
- develop a problem-solving process, whereby schools would systematically identify such problems and select and implement new ideas; and
- organize a linkage system, whereby national, state, and other external resources would be made available to school personnel.

The RDU program is unusual among federally funded dissemination strategies because of its dual commitment to the dissemination and use of R&D products and to the development of local school capabilities to solve problems through the use of externally generated knowledge. Other federal programs, including some of those which you will hear about in this panel discussion, have tended to concentrate on either product dissemination or local capacity building, but not on an integrated model for combining the two. The core of the RDU strategy was to provide each participating site, which was either a school or a district, with assistance in the following sequence of activities:

- identification of a problem or set of problems;
- examination of alternative solutions to the problem, focusing particularly on the products of educational R&D;
- selection of a specific solution to address the problem;
- implementation of the solution;
- evaluation and incorporation of both the solution and the problem solving process.

The service delivery system of the RDU program operated through seven projects, each of which coordinated a network of organizations and individuals involved in the provision of services and information to local schools and school districts. As a whole, the seven projects operated in 20 states and served over 300 schools or school districts over a three-year period (1976-1979). Each of the projects selected and made available a pool of R&D products, which was also referred to as a knowledge base. These knowledge bases were developed as a resource for identifying solutions to match client school needs. The projects also deployed "linking agents" who coordinated the services provided to local schools and school districts, and who helped guide the local school personnel in a school improvement process. Each project supported two or more linkers. Most operated out of an intermediate service agency, or a state education agency, and each served a specific set of local schools or school districts. The range of a linker's possible roles included facilitating the decision-making process by clarifying goals and providing leadership, and mediating among autonomous organizations whose resources and services required coordination. The seven projects were regionally distributed, and involved the following:

- The Northwest Reading Consortium, a consortium of four states in the Northwest--Washington, Oregon, Alaska, and Idaho.
- The Georgia State Department of Education.
- The Pennsylvania Department of Education.
- The National Education Association, which operated its project in collaboration with the State Education Agencies and corresponding state education associations in 12 states.
- The Florida Department of Education.
- The Michigan Department of Education.
- The NETWORK/Consortium, a non-profit research and service organization which coordinated agencies in six states.

In November 1977, Abt Associates Inc., a social science research firm based in Cambridge, Massachusetts, was contracted to conduct a study of the RDU program. The study addresses six major issues:

- How relationships are managed between various agencies which have the expertise and resources to help local schools solve problems;
- To what degree an intervention program such as RDU can help schools overcome barriers to successful problem solving (such as limited access to information, or lack of planning skils, etc.);
- To what degree the products of educational R&D are relvant to the problems and contexts of local schools;
- What the impact is of the products of educational R&D once they have been adopted and implemented;
- What factors contribute to the institutionalization of the RDU approach within a variety of organizations;
- How linking agents coordinate the flow of external resources to schools, and whether this helps the schools solve problems.

All of the seven projects have completed the federally supported service delivery part of their activities. However, our research efforts are just beginning to bear fruit. While we have already produced a number of interim reports (Chabotar and Kell, 1978; Louis et al., 1979; Yin, Gwaltney and Louis, 1980; Spencer and Louis, 1979; Kell and Louis, 1979) we have only recently completed the data collection that will allow us to assess the impact of the RDU program on schools. Thus, the following discussion of findings and policy implications is necessarily preliminary and limited.*

PRELIMINARY FINDINGS ABOUT THE R&D UTILIZATION PROGRAM

Because a key feature of the program design was its equal emphasis upon products and problem-solving processes, the discussion of our preliminary findings will be divided accordingly.

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*The final reports from this study will be available in the winter and spring of 1981.

Findings Related to the Applicability and Impact of R&D Products on Schools

The intent of the R&D Utilization Program, as it was expressed in the RFP and other early documents, was to help schools solve educational problems through the use of existing research and development based "products" (curriculum innovations). The original RFP indicated that respondents should limit their knowledge bases to products related to either basic skills or career education. In addition, the RFP indicated that contractors should emphasize quality control over the products. The products should show evidence of effectiveness and evidence of transportability from one site to another. Thus, throughout the early portions of the RDU program, a great deal of attention within each project was given to developing a knowledge base that contained acceptable products and designing a process for delivering these products to the schools.

Because the RFP specified empirical validation as the criterion of quality, a major issue for each of the projects had to do with the product's acceptability by evaluative standards.* Our analysis, however, suggests that many schools eventually were presented with numerous non-validated products for adoption, including the following examples:

- Two projects provided assistance in career education, a curriculum topic that had been identified in the RFP but in which the bulk of existing products had not been validated. As one result, only 20 percent of one project's products were believed to be validated.
- Several projects provided assistance on topics that were not identified in the RFP and in which available products were also mainly non-validated.
- In other projects, individual schools were reported to have adopted products that had not been validated.

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*Projects were initially allowed to disseminate non-validated products only if they developed and implemented validation procedures themselves.

In only two projects did it appear that schools had adopted only validated products. The fact that the seven product pools collectively offered nearly 600 products for sites to consider (of which over 100 were adopted by one or more of the sites served during the project) made it impossible for us to determine a precise "quality" measure for each of the knowledge bases. However, an inferential use of secondary data and reports from project staff members leads us to estimate that possibly 60 percent of the adoptions made by RDU sites involved non-validated products. This slippage between the intent of the original RDU mandate, as represented in the RFP and other early documents, and the actual operation of the projects occurred despite enormous efforts by each of the seven projects to develop a knowledge base responsive to the program's design.

The primary reasons for this slippage were:

- the adequacy of the pool of educational products; and
- site (school or district) preferences.

As noted above, in many areas there are simply not a sufficient number of formally validated educational products to meet the needs of local schools. Among the topics treated by the R&D Utilization projects in which few acceptable products were found were the following: career education, district or school-wide planning, and in-service training for teachers. In addition, the area of secondary school curricula, particularly in the area of basic skills, produced very few tested educational products that met school needs. In order to be responsive to the service delivery mandates of their programs, the RDU projects were forced in many instances to use expert judgment on surface validity, rather than external evaluation data as the quality control basis in admitting products to their pools.

In approximately 20 percent of the cases, sites chose products that were not part of the project's knowledge base. In other instances, sites "officially" chose an "approved" product, but in fact spent most of their effort in developing their own innovation or implementing a non-validated product. In most cases, these "low quality" selections were made after six months to a year of intensive involvement between the site and the project. At this point it was very difficult to terminate a site solely because it had not found an acceptable product from within the knowledge base. In sum, client demands and concerns overrode the specified quality control procedures in the product delivery process.

Despite these constraints, projects were able to provide acceptable, attractive products to almost all of the schools involved in the program. Furthermore, the data indicate that the selected products were received with enthusiasm in most schools:

- A survey of teachers indicates that approximately 80 percent of those who are eligible to use the product are, in fact, using it.

- In addition, approximately 50 percent of the surveyed teachers responded enthusiastically to questions about the quality of the product, that is, items such as whether or not it provides new ideas, whether it is directly relevant to the most pressing problems or needs in the school. (Teachers responding that the item is true to a great or very great extent).

- Finally, principals report that a fair degree of product institutionalization has already occurred. Sixty-four percent, for example, indicate that the program or materials have been formally incorporated into school curriculum plans. Approximately 60 percent indicate that locally written guidelines for the use of materials and methods have already been developed or will definitely be developed in the near future. Sixty-two percent predict extensive use of the materials or methods by teachers in the future.

What characteristics of the product, if any, are related to the desired positive outcome or effects of the R&D Utilization program in schools? Based on Abt Associates' analysis and coding of data from approximately 75 schools

which were visited either by Abt Associates staff or case study writers employed by the seven projects, we have developed five preliminary outcome measures which are related to the overall objectives of the program. Three of these reflect the overall impact of the program on the school. These include:

- the scope of implementation, or the percentage of students and the percentage of the student day affected by the implementation of the product;
- institutionalization, (sustained use) of the process and product; and
- a scale of organizational change, composed of items tapping the amount of improvement in curriculum, materials, methods structure, teacher morale, pupil performance, and status of the problem that occurred as a result of the innovation.

An additional two outcome variables are related to the quality of the problem solving process engaged in by the school. These are:

- the level of effort devoted to problem solving; and
- our judgments about the quality of the problem solving behaviors, including the degree to which they met criteria of logical and rational behavior and the degree to which they reflected sound group problem solving strategies. (Intercorrelations between these five outcome measures may be seen in Table 1.)

If we look at the last line of Table 2, it may be seen that product characteristics are particularly strong predictors of the scope of implementation, of institutionalization, and of organizational change. The product variables that are the most important predictors of these outcomes of the R&D Utilization Program are:

- whether or not there is any empirical evidence of the effectiveness of the product, in other words, whether the product is validated;
- whether the product is complex, in other words, does it have many parts, and is it designed to change many aspects of the school's program at once, and finally;

- whether the product is designed to affect pupils directly, in other words, whether it is related to the curriculum, rather than to administrative procedures in the schools, or to inservice.

Each of these variables--validated effectiveness, complexity, and direct impact on pupils--is positively related to the outcome measures.

One "non-finding" is also of significance. Our data do not provide support for the "Change Agent Study" (Berman and McLaughlin, 1979) emphasis on the importance of local materials development. Variables which tapped local materials development and the degree to which products underwent substantial local modifications do not effectively predict any of the RDU outcomes. We suspect that the local materials development variables in the "Change Agent Study" are best thought of as proxies for a participatory, broadly based process of change, (one outcome of which will be local materials development in a program which does not emphasize adopting externally produced curriculum products).

Policy Implications of Preliminary Product Findings

Our preliminary product findings have a number of significant policy implications. First, it is likely that any effort to rapidly expand the dissemination of existing R&D products will not meet many of the most pressing locally defined problems in schools because few products exist in these areas. If the federal government wishes to pursue active dissemination of validated products to serve local school needs, they must also engage in a more active and rationalized product development strategy than is currently being pursued.*

Second, no matter how well developed the product base, there will be some schools that choose to adopt non-validated commercial or practitioner-developed

*Current federal priorities do not favor curriculum development. Curriculum or product packaging and marketing support is provided almost exclusively to Developer/Demonstrators through the NDN program.

products over R&D products--or indeed to develop their own solutions. However, based on the experience of the RDU sites, the number of schools unreceptive to validated products is apparently quite small. In other words, where validated and/or R&D based products exist and are disseminated, they are eagerly accepted by local school districts. Lack of prior widespread use does not mean a lack of relevance or potential utility of these products, but rather reflects a lack of exposure. It should be emphasized that the selection of sites to be included in the R&D Utilization program did not exhibit any bias toward sites with characteristics that might be thought to be predictive of strong interest in R&D products. Most were rural and had only limited experience with R&D products prior to their involvement in this program. Only 12% of the schools were classified by us as frequent users of new ideas or programs. In addition, the schools were frequently picked for inclusion in the program because they exhibited problems and not because they exhibited a high state of readiness to change.

Third, there is evidence to suggest that the characteristics of products are important in determining whether there will be a lasting and substantial impact upon the educational environment of the school. In this case, validation or the existence of empirical evidence of effectiveness is apparently an important criterion. In our data, the validation variable also subsumes other characteristics of the product: Many of the validated products were supported by NDN developer/demonstrator grants and were better packaged, had more easily available materials, and often had more experienced trainers, who were available to provide assistance both before and after implementation. This indicates that, despite the dilemmas associated with applying quality control procedures to the development of a knowledge base, these quality control procedures may be one of the single most important factors determining program

outcomes. It is also important to note that complex innovations requiring greater change on the part of implementing teachers are also an important component in producing implementation, institutionalization, and organizational change.

To summarize, validated products can have a big impact in the school improvement process, and the current belief that local materials development or adaptation is necessary in order to produce significant and lasting change in schools can be challenged. A federal R&D based school improvement strategy should emphasize curriculum development in areas that are responsive to school needs not currently met by existing products, should continue to concern itself with quality control screening, and should engage in active marketing to ensure that schools that would not normally come into contact with information about products will do so.

Preliminary Findings about the Problem Solving Process

The problem solving process in the R&D Utilization program was a relatively complex one which involved mustering both internal and external resources. Each of these will be discussed in turn.

Internal Strategies: In most cases, the "RDU approach" involved the development of an internal problem solving team, which received a mandate from the school and district to take responsibility for defining a problem, examining solutions, and planning for implementation, as well as monitoring and evaluating implementation in some cases. These teams were, typically, intended to include representatives of different role groups within the school. At minimum, they were to include representatives of the group that was intended to use the product, and representatiaves of either the central office or school administration. In many cases, however, the representation was much broader, including for example, grade level representation of all

teachers, principal representation, and representation of central office administrators and/or specialists. In some cases parents and students were also included.

The problem solving process that was used in the majority of schools involved in the R&D Utilization program was quite different from the typical innovation practices of most schools. Innovations in schools, according to our respondents, are typically introduced because a principal or an individual in the district office becomes enchanted with a new practice, and it is imposed upon a school staff that is not equally enthusiastic. In the R&D Utilization program, in contrast, influence was centered at the teacher level. Thus, for example, if we look at the distribution of influence in selecting a new solution to the identified problem, we find that central office staff had a high level of influence in 24 percent of the sites, as did principals in 40 percent of the sites, as contrasted to 65 percent of the sites in which teachers had a high level of influence. In addition, a survey of principals indicates that fewer than 6 percent believe the RDU approach to problem solving was not distinctly different from practices they had previously engaged in.

The function of the teams as it was interpreted by the seven projects was to increase the salience of, and effort devoted to, the problem solving process, where quality was typically defined by adherence to a rational model of analyzing needs, matching solutions to those needs, and of careful planning for and monitoring of implementation, and to increase the real influence of participation of parties who would be most affected by decision outcomes.* Looking at Table 1, we see that the level of effort devoted to the problem solving process is significantly correlated with all of the other RDU program

*In this preliminary analysis we are aggregating measures of rationality and participation. Later reports will examine these aspects of the process separately.

Table 1

INTERCORRELATIONS(R) OF FIVE OUTCOMES OF THE RDU PROGRAM

	Scope	Level of Effort	Quality of Process	Institutional-ization	Organizational Change
Scope of Implementation		.27* (60)	.05 (55)	.55* (54)	.39* (51)
Level of Effort-Process			.44* (64)	.36* (60)	.38* (62)
Quality of Process				.24 (55)	.36* (54)
Institutionalization					.66* (51)
Organizational Change					

*Significant at the .05 level.

outcomes. Level of effort is particularly highly correlated with institutionalization (R = .36), and organizational change (R = .38). The quality of the problem solving process, on the other hand, is not significantly correlated with either the scope of implementation, or with the level of institutionalization, although it is significantly correlated with organizational change (R = .3).

Further confirmation of the limited importance of an improved process in changing schools may be seen in Table 2. Row 3 of this table shows the results of regressions which regressed the five outcomes of the RDU program on a series of variables which tapped the influence of the local team and of various role partners: teachers, principals, central office staff members and the Superintendent. Again we see that these process variables which reflect the degree of participation of different actors in the decision making process have no significant predictive power for scope of implementation, level of effort, or institutionalization of the product and process. However, they do significantly predict the degree of organizational change.*

To summarize, achieving the RDU objective of improving the quality of the problem solving process in a school apparently has relatively little effect on the short-term objectives of implementing and institutionalizing a new product. Improving the process may, however, have more significant, long-range impacts upon the functioning of the organization and the quality of its curriculum. Our qualitative data suggest that changes in participation in problem solving, and particularly the involvement of teachers in the problem solving process, frequently had significant impacts on teacher morale, communication patterns within the school, and individual staff development.

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*Not surprisingly, role partner and team influence are predictive of the quality of the process. This relationship is expected, since one aspect of quality concerned the degree to which different actor groups were effectively represented.

Table 2

PERCENTAGE OF THE VARIANCE EXPLAINED IN FIVE OUTCOMES OF THE RDU PROGRAM: DATA FROM THE CONSOLIDATED CODING FORM **

PREDICTOR VARIABLES	OUTCOME VARIABLES				
	Scope	Level of Effort	Quality of Process	Institution-alization	Organiza-tional Change
Readiness	.19*	.06	.12*	.32*	.06
Linking Agent Behavior	.29*	.25*	.32*	.11*	.19*
Process-Role Partner and Team Influence	.05	.06	.38*	.09	.35*
Product Characteristics	.49*	.11*	.27*	.43*	.54*

*F statistic for regression equation significant at .05 or better

**All regressions have between 49 and 55 cases included. Equations were obtained through a stepwise regression procedure which optimizes its F ratios. (SAS Institute, 1979) Equations contain between 1 and 4 variables.

In addition, product selection and adoption were often the excuse for more comprehensive changes in curriculum or instructional management.

External Strategies: In addition to the development of an internal teacher/administrator team with a broad mandate for decision making, the RDU process typically involved external actors, or linking agents. These linking agents varied enormously in the amount of time they were expected to commit to each of the schools they worked with, ranging from 2 or 3 percent to 25 percent over a three-year period. In addition, they varied in terms of the roles they were expected to perform. In some cases they were expected to serve only as a communications link between the project and the site, including communicating the projects' expectations about the type of problem solving activities that the site would engage in. In other projects they were expected to take strong change agent postures in guiding the school through the problem solving process and in providing specialized consultant assistance in the topic area in which the school's problem was identified. While a major component of our study is focused on improving our understanding of how and why linking agents functioned as they did in this program, this presentation will consider only the impact of linking agent behaviors and internal strategies upon school outcomes.

In contrast to the relatively limited impact that the problem solving process (aside from level of effort) has upon product implementation, the linking agent and his or her activities has a broader and stronger effect. Row 2 of Table 2 indicates that when the five RDU outcomes are regressed on linking aagent activities and characteristics all equations are significant. The linking agent behaviors that seem to have the greatest impact on scope, level of effort, quality of the problem solving process, institutionalization, and organizational change have significant policy relevance:

- The amount of time that linking agents spent with client schools--a variable which we have noted is highly variable--was extremely important as a predictor of RDU outcomes.

- Second, the amount of influence that the linking agent had over client and team activities and decision making is a critical predictor variable. In some cases linking agents chose to behave neutrally at all times and to facilitate, but not participate. In other cases, linking agents took stronger normative stances, acting either as change agents, or becoming involved in directing or influencing the local teams.

- Finally, the degree to which the linking agent adopted a facilitator or process role, which involved surfacing and resolving conflicts, providing training and problem solving in group process, and providing technical assistance in diagnosing the problem and assessing the match between innovations and solutions is a critical predictor. (Other roles which were less significant as predictors were acting as a curriculum area specialist, or simply a general support person.

It is interesting to note that linking agent behaviors are least powerful in predicting RDU outcomes that occur later in the process: institutionalization and organizational change. Linking agents have more influence over the level of effort devoted to problem solving, the quality of the problem solving process, and the initial scope of implementation of the product.

The preliminary analyses suggest that, while the role of the internal team is important--particularly in producing longer term organizational changes--these beneficial outcomes of improved internal problem solving are unlikely to occur in the absence of an external catalyst. Our own observations in the 42 schools that we have visited suggest that school staffs that are unable to go through an effective problem solving sequence and to choose and implement an innovative program without the assistance of an external agent are typically blessed with some form of indigenous leadership which is to compensate for--in the initial stages, and later to develop--internal capacity.*

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*In most cases, we believe that the relationship between leadership provided by the internal team and that provided by the linking agent was a key factor in predicting success, an hypothesis that we will explore further in future analysis.

Client schools and individual educators recognized the significance of the linking agent. When teachers, for example, were asked to rate their satisfaction with the assistance, services, or support provided by various individuals or groups, satisfaction with the linker was rated only slightly lower than satisfaction with the local school team. Satisfaction with linkers was considerably higher than satisfaction with product developers from whom they received training or assistance. Forty-six percent, as compared to 31 percent, were very or extremely satisfied. The rating of linkers as sources of assistance and support was even higher than other external providers of assistance, such as other RDU project staff or other consultants. Principals indicated a similar recognition of the helpfulness of the linker in performing a variety of activities related to the problem solving process. Principals, in general, exhibited a more positive attitude toward linkers, which results largely from the fact that they received more direct assistance from the linkers.

Despite local recognition that an external linking agent was an important part of the process, the use of the services of an external linker was the aspect of the process that principals were least likely to indicate they would use again. Thus, for example, approximately 35% of the principals indicated that they would definitely use the RDU approaches to problem identification or identification of solutions or planning for implementation, but only 13% indicated that they would definitely use the services of an external linker in a further problem solving effort. Our site visits suggest that availability of linkers is the key reason for this response--the RDU linking roles were discontinued in most cases after the demise of federal funding, and other local agencies did not employ persons who could or would enact the "generalist" helping role.

Policy Implications of Preliminary Process Findings

A number of conclusions that are directly relevant for federal dissemination policies may be drawn from the above findings. First, it is clear that the process is important in determining the organizational outcomes of a dissemination program. In particular, dissemination programs that do not encourage and support high levels of effort on the part of school staffs in engaging in a problem solving process are less likely to effect long-term organizational change. Since level of effort in the R&D Utilization program was significantly affected by the availability of release time paid for by the projects, it is clear that if a dissemination program seeks real educational impact, mechanisms for underwriting the necessary labor must be found.

Second, the degree to which the process was of high quality (e.g., approximated theoretical ideals of rationality and/or participatory decision making) is of importance in determining the degree to which real change is effected. If the goal of a dissemination program is simply to implement a new activity or curriculum product in the short run, we need not perhaps pay a great deal of attention to the development of local capacity. If, however, our goal is to improve the functioning of schools and the long-range quality of their curriculum, we cannot afford to ignore school needs for assistance and training in problem solving.

Finally, the role of the external linking agent who spends a considerable degree of time with the school over a longer period of time, and who takes an active and instrumental change agent posture, is a significant feature of the process. It is important to emphasize that it is not simply the presence or availability of a generalist who provides only an extra pair of hands to support locally determined activities (although the significance

of such support should not in any way be underestimated). It is, in addition, the role of the linking agent as an initiator and as a facilitator of the process that is a key to both improved functioning of the internal team and increases in the scope of implementation. This finding further extends the potential policy dilemma that is inherent in all current dissemination programs that employ linking agents. That dilemma is that linking agents appear to be effective only insofar as they provide their clients with a relatively substantial and continuing assistance. Nevertheless, in any federally funded effort that is not a demonstration program, the pressure to provide services to all comers is clearly present. Many observers have criticized the RDU program as an unrealistic model because of the external resources provided to the schools largely through intensive linking agent roles which inherently reduce the potential scope of the client base. However, policy makers cannot and should not ignore the equity dilemmas that are embedded in school improvement programs. The RDU program shows some evidence of a strategy that can effectively stimulate change in schools that have multiple educational problems and limited internal resources for meeting those problems. If high levels of resources are needed to meet the needs of these schools, the goals of educational equity may indeed compete with the goal of equal access to resources.

Summary and Caveats

The results of our preliminary analysis suggest that the interventions that were part of the original RDU project design were largely effective. The underlying assumption that both the availability of high quality products, the development of an improved problem solving process inside the school, and the access to external technical assistance will promote school improvement is supported. In addition, the variables related to the RDU intervention are more powerful predictors of the success of the school improvement efforts in the

sites served by RDU than is the school's initial "readiness," as measured by previous experience with innovative efforts, with federally funded programs, with using externally developed R&D products, etc. (See Table 2.)

It should be stressed, however, that these results are quite preliminary and have not been tested in our larger data base, which includes survey data from principals and teachers on a large sample of RDU sites. A more significant conceptual limitation of the analysis presented here must be mentioned. The above discussion emphasizes a view of school change that is primarily "technological" in nature (House, 1980). RDU strategies are viewed as "inputs," and the success of the school change program is viewed as the "output." We wish to emphasize that our qualitative data suggest that this view is highly simplistic, regardless of the predictive power that we have achieved with program variables. In the real world of the school, we have observed that much of the responsibility for the success of a change project is dependent not on factors that are predictable, or known at the beginning of the process, but which might be labeled "normal critical events." These key events occur with sufficient frequency in the cycle of school activities that they cannot (or should not) simply be thought of as sources of error in our regression equations. Among the most important and frequently occurring events were: turnover of key administrators, both in the central office and in the school; strikes or prolonged contract negotiations; and reductions in force. It should be emphasized that critical events do not necessarily impede a school change effort--even strikes may have positive impacts by increasing the cohesiveness of the school. Whether effects of events are good or bad, however, their impact upon the problem solving process and its outcomes are as strong as the findings presented here. Thus, in our later analyses we will move beyond a simple "technological" perspective on the problem of school improvement,

Table 3

SIGNIFICANT PREDICTORS OF
OUTCOMES OF RDU PROGRAMS*

Readiness

(1) Centrality of problem (problem is viewed as the most important in the school by most staff)

(2) Problem identification prior to involvement in program

Linking Agent Behaviors:

(1) Time: Amount of time spent with client school

(2) Influence: Amount of influence over client activities and decision making

(3) Process Role: Degree to which agent acted as a strong process facilitator

Process Variables

(1) Strong internal team

(2) High teacher influence

Product Variables

(1) Empirical evidence of effective areas

(2) Affects pupils directly

(3) Product is complex (has many parts)

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*Significant defined as entering at least three of five regressions, with an F statistic significant at .10 or better.

and begin to analyze how other political, structural and cultural characteristics of the school affect the outcomes of the change process.

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APPENDIX A

A Note on Methods

The analysis presented in this paper is based on data collected from schools using qualitative research methods. Approximately half of the schools were "case study sites," and were visited regularly by a case study writer over the period of several years. The case study writers were employed by the seven operational RDU projects rather than Abt Associates, but the AAI research team had some influence over the content and analysis of the case study data. The case study sites were not chosen by any statistical sampling scheme, but it is known that all projects selected the sites to be included in case studies before there was any data that would have allowed a prediction of "success."

The remainder of the sites were visited by AAI research team staff members. The number of person days at a site varied from four to seven. During the site visits, a topical guide was used as a basis for conducting open-ended interviews with school and district administrators, and a sample of between five and ten teachers and specialists at each site. Site visit notes were developed on the basis of the interview, and were written according to the topical inteview guide which reflected the variables included in this study. Sites were selected as follows: each project nominated their "worst" site, and the site that best exemplified what they were trying to do. Four more were sampled randomly from among the remaining non-case study sites in each project.

In order to include the rich, qualitative data in our quantitative data base, each site was later subjected to a coding procedure, which involved having the individual most familiar with the site read through all materials available for that site (which included some early survey data,

reports written by RDU project personnel, site reports and/or case studies, and any other materials or documents that were available) and answering over 120 likert scale or dichotomous scale questions. An inter-rater reliability check produced a score of .72 when disagreements based on "can't judge because of too little information" were eliminated (this elimination was done because one of the raters was more familiar with the site than the other).

Later analysis in this project will be based not only on this data, but upon a survey of teachers and principals. These surveys focus more heavily upon the program client attitudes toward the services that they received in the program. In addition, the case studies and site visit materials will be analyzed using more traditional "wholistic" qualitative methods.